Operations manual

MiniLink® Data 900 and 2400 MHz Series

FCC NOTICE

This equipment has been tested and found to comply with the limits of a Class B device, pursuant to PART 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference.

This equipment generates, uses and can radiate radio frequency energy, and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate the equipment.

RF EXPOSURE NOTICE

This equipment is approved only for mobile and base station transmitting devices, separation distances of (i) 20 centimeters or more for antennas with gains < 6 dBi or (ii) 2 meters or more for antennas with gains $\geq$ 6 dBi should be maintained between the antenna of this device and nearby persons during operation. To ensure compliance, operation at distances closer than this is not recommended.

INDUSTRY CANADA NOTICE

The term "IC:" before the certification/registration number only signifies that the Industry Canada technical specifications were met.

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

INDEX

QUICK START GUIDE

MicroTek Electronics, Inc. recommends that all equipment be bench tested before being installed onsite. This test will ensure that all components of your application are functioning properly.

DATA TRANSCEIVER SET-UP

1. Remove each Transceiver from the box and attach its omni-directional dipole antenna.
2. If the device in use operates at a different Baud Rate than the factory setting of 4800, the radio must be changed to the desired Baud rate using the Software. See Pages 5 and 6 for information on changing the radio's Baud Rate.
3. Select the correct mode of operation; either RS-232 or RS-422/485. Factory set to RS-422/485.
4. For RS-422/485, determine whether a 2-wire or 4-wire set-up is required and wire into TX +/- at the control panel and RX +/- at the camera (Pan / Tilt / Zoom Camera applications).
5. Perform a bench test to make sure all PTZ functions can be controlled wirelessly.
6. Mount each Transceiver in an area that has clear, wide-open line of sight to the other Transceiver. A weatherproof enclosure must be used if mounted outdoors or in a harsh environment. If our weatherproof enclosure is used, mount using the double-sided tape. There is enough room in our weatherproof housing for the video transmitter/receiver and Data transceiver.
7. The red LED will light up when power has been connected and applied. One 12 VDC power supply is included in the system for each Transceiver.

Trouble Shooting: If you cannot control the PTZ functions wirelessly or if you are having other operational difficulties, please visit the trouble shooting section in this operations manual or contact MicroTek toll free at (888) 366-4276 for technical assistance. MicroTek's toll-free technical assistance is available weekdays from 8 am to 5 pm Pacific Time.

PRE-INSTALLATION REMINDERS

The information on the Quick Start Guide is intended for ease of use and application, the following reminders will help to ensure your satisfaction with MicroTek products and service.

1. Read through this manual before bench testing and installation
2. Make sure that you set the Data radios to the Baud Rate that will match your Control and/or Camera
3. Perform a bench test incorporating all components of the application
4. Install your MiniLink Data 900 or 2400 MHz System
5. Toll-free technical assistance is available Monday through Friday (8-5pm PST) at 1-888-366-4276

MICROTEK ELECTRONICS RETURN POLICY

All MicroTek Electronics equipment comes with a 2-year limited warranty for repair or replacement (see the last page for warranty information). In addition to the 2-year warranty, all products can be returned within the first thirty days for credit. Products may be returned within 30-days of shipment provided the products are in like new condition and in the original packaging. Contact your MicroTek Electronics dealer or distributor to obtain an authorization to return the merchandise for credit.

Return authorizations for repair can be sent directly to MicroTek Electronics with a valid RA number. Call our technical assistance line, 1-888-366-4276, to obtain an RA number for repair.

MINILINK 900 AND 2400 MHZ DATA TRANSCEIVERS

TRANSCEIVER DESCRIPTION

The MiniLink Data 900/2400 transceivers are either point-to-point or point-to-multi-point units. Software is provided to configure each radio to match the configurations of your camera and controlling device. If the Baud Rate is not set correctly, the control functions will not transmit and the camera will not move accordingly. MiniLink Data 900/2400 transceivers are designed for line of sight operation and will transmit in varying ranges up to 20 miles depending on antenna configuration.

A. FRONT VIEW
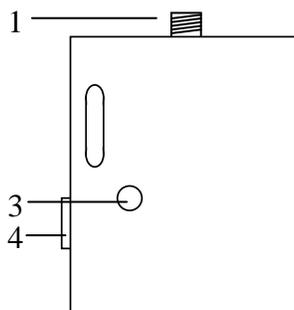
B. SIDE VIEW

1. SMA Connector
2. RS-422/485 4-Pin Screw Terminal
3. Mode Select
4. RS-232 DB9 Connector
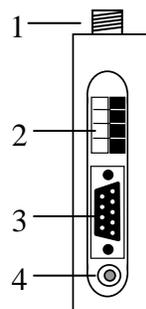
1. SMA Connector
2. RS-422/485 4-Pin Screw Terminal
3. RS-232 DB9 Connector
4. Power Input

C. DATA CONNECTIONS
1. RS-232

DB-9 Pin	RS-232 Name	Description
1	RLSD	Not Used
2	RXD	Received Data
3	TXD	Transmitted Data
4	DTR	Data Terminal Ready
5	GND	Signal Ground
6	DSR	Data Set Ready
7	RTS	Request to Send
8	CTS	Clear to Send
9	RI	Not Used

Pin 5   Pin 1

Pin 9   Pin 6
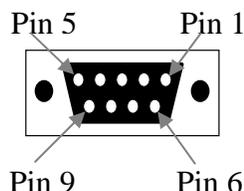
2. RS-485 (Half Duplex / 2-wire)

−
+   TX - Transmit
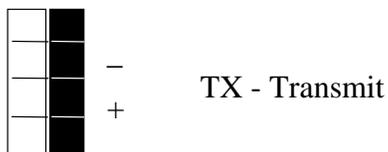
3. RS-485/422 (Simulated Full Duplex/4-wire)

-
+   TX - Transmit

-
+   RX - Receive
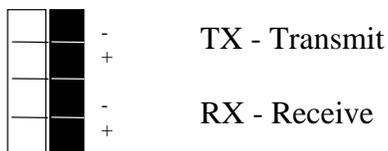
TRANSCEIVER OPERATION

HOW TO SET UP EACH TRANSCEIVER
1. LOCATION
   Each Transceiver is designed to be placed on a flat surface for stability. The transceivers are not weatherproof and should be placed indoors or in an environmental enclosure if used outdoors or in a harsh environment. Included in each of MicroTek's environmental enclosure is a piece of double-sided tape that can be used to mount the transceiver inside the housing.

2. POWER
   The MiniLink Data unit is powered by a 6-20 VDC power supply connected through the power jack at the side of the transceiver. Each transceiver incorporates reverse voltage protection and will draw 200 mA of power.

3. SOFTWARE CONFIGURATION
   MiniLink Data 900 or 2400 MHz Transceivers are preprogrammed at the factory with the following settings:

Baud	4800
Flow Control	None
Data Bits	8
Parity	None
Stop Bits	1

   If your system is using the above listed protocol, there is no need to install the supplied MiniLink CTU Software. Identify the type of data configuration your system will be using and make the data connection using the RS-232 DB9 connector or RS-485/422 4-position screw terminal. See section C "DATA CONNECTIONS" above for the different connection types.

4. MINILINK CTU SOFTWARE
   The MiniLink-CTU Software included with the MiniLink Data 900 or 2400 MHz Transceiver is provided in case it is necessary to change the parameters of the transceiver for a particular application.
   - To install the MiniLink-CTU Software double-click on the "minilinkctu.exe" located on the media included with your transceiver. Follow the prompts of the installation screens.
   - To use the MiniLink-CTU Software, connect the MiniLink Data transceiver from the DB9 connector on the unit to the COM1 serial port of a PC using the supplied straight through DB9 Serial Cable. Remember that the Baud Rates of the COM1 serial port and the transceiver must match, and 4800 is the factory setting. Also make sure that the mode select switch is in the RS-232 position.
   - The MiniLink-CTU Software is organized into 3 tabs:
     i. Set-up
     ii. Com Test
     iii. Configuration

TRANSCEIVER OPERATION (Continued)

1. Set-up Tab

    This screen is used to set the PC Serial Port to interface with the MiniLink Data 900 or 2400 MHz Transceiver. The parameters in this tab must match the PC Serial Port Parameters for communication to be established.

2. Com Test Tab

    This screen is used to test the MiniLink Data transceiver and monitor communications once the two transceivers are both set to match the parameters of your system.

    Running a Com Test: (See Notes and instructions on the CTU Software below before testing)
    1. *Two Data transceivers must be in RS-232 mode, powered up, and antennas attached in order to communicate with one another.*
    2. *One transceiver must be connected to a PC or laptop using the 9-pin DBP Serial Cable to the PC's Com Port A, with the CTU Software loaded and running. The other unit must have pins 2 and 3 grounded with a paper clip.*
    3. *Click on the "Com Test" tab & click "Start". Test results should appear on the screen (Either "Good" or "bad"). You can click "Stop" when you like. Click "Clear Results" and switch the units to make sure they pass the test as a transmitter and as a receiver.*

3. Configuration Tab

    This screen is used to configure the MiniLink Data 900 or 2400 MHz Transceiver parameters.
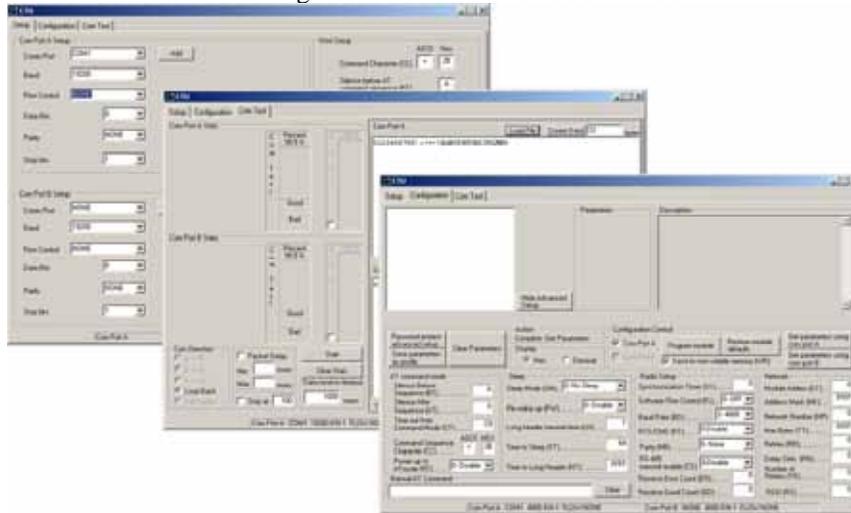
    - To establish communication between the MiniLink Data Transceiver and the MiniLink-CTU Software, click on the configuration tab, and select "Show Advanced Set-up" then click on the "Get Parameters Using Com Port A" tab. The AT command mode, Sleep, Radio Set-up and Network field will populate if the Baud Rate on the "Set-up" tab and the Baud Rate of the radio match. (Factory set to 4800). If the fields do not populate, check the Com Port A setup parameters and retry.
    - To change parameters, click on the field or drop down arrow you wish to change and enter the desired value. Click "Program Module" to send the new parameters to the MiniLink Data Transceiver. In most cases, only the Baud Rate will need to be changed.
    - To verify that the radio is now configured to the desired parameters, click on the "Set-up" tab and set all applicable fields to the new setting and click on the "Configuration" tab. Then click on "Get Parameters Using Com Port A" and all fields should populate and represent your desired settings.

TRANSCEIVER OPERATION (Continued)

- Avoid clicking on "Restore Module Defaults" as Multiple Default-Resets could result in a software lockout, requiring a factory reset of the Transceiver unit(s). If you are experiencing software difficulty, try refreshing by clicking on a separate file tab such as "Set-up" and re-click "Configuration" then try the command again.

NOTE: All transceivers communicating with one another in a system must be configured identically. If the parameters are changed and the MiniLink transceiver is disconnected from the PC, the com port parameters of the PC will need to be changed to match the transceiver to re-establish communication.

5. ORDER OF SETUP AND OPERATION
    1. Connect Power. A red light, or an LED, will be viewable near the RS-485 Connector inside of the case once power is applied.
    2. Connect Data input. (See page 4)
    3. Set the Mode Select switch to the data protocol used by the device being controlled.
    4. Make sure the antenna is attached to the SMA connector.
        a. Data 900 Transceivers use a 7" omni-directional dipole antenna that flexes at its base.
        b. A Data 900 20-Mile System will use one 7" omni-directional dipole antenna on one transceiver and the other transceiver will use a 30" Yagi directional antenna with a 10' cable that connects to the SMA connector.
        c. Data 2400 Transceivers use a 4" omni-directional dipole antenna that does not flex at the base.
        d. A Data 2400 10-Mile System will use one 3" omni-directional dipole antenna on one transceiver and the other transceiver will use a 12" x 12" Patch directional antenna with a 10' cable that connects to the SMA connector.

6. MAINTENANCE

Your MicroTek Electronics MiniLink Data Transceiver is an example of superior design and craftsmanship. The following suggestions will help to ensure maximum operational life.

- Keep the product dry. If it does get wet, wipe it dry immediately. Liquids may contain minerals that corrode electronic circuits.
- Use the system only within the environmental specifications indicated. High temperatures can shorten the life of electronic devices and melt plastic parts.
- Excessive mechanical shock can damage the case, connectors, cable or internal circuit board.

Moving or tampering with the system's internal components can cause a malfunction and will void the systems warranty as well as the FCC authorization to operate it. If you cannot control your system wirelessly or if you are having any other problem, contact your dealer and/or MicroTek for service.

TRANSCEIVER SPECIFICATIONS

RF SECTION

Power Output	140 mW (900 MHz),
	50 mW (2.4 GHz)
Transmitting Frequency	900 to 928 MHz
	2.4000 to 2.4835 GHz
Modulation	Frequency Hopping Spread Spectrum
Channel Capacity	7 hop sequences share 25 frequencies
Over Air Baud Rate	Up to 19200 bps
FCC ID	OUR9XSTREAM (900 MHz)
	OUR-24XSTREAM (2.4 GHz)
Industry Canada	4214A-9XSTREAM (900 MHz)
	4214A 12008 (2.4 GHz)
Europe	ETSI, CE (2.4 GHz)

DATA SECTION

Input	RS-422/485 or RS-232
Output	RS-422/485 or RS-232
I/O Data Rate	Software selectable 1200-57600 bps
Mode Select	2-position slide switch

MECHANICAL

Dimensions	2.875" x 3.313" x 1.0"
Weight	7.2 oz
Connections	Power supply, RS-232 DB9 & RS-422/485 terminal block

POWER

Power Requirements	6-20 VDC @ 200 mA
	Reverse voltage protected

ENVIRONMENTAL

Humidity	95% non-condensing
Operating Temperature	-10F to +180F

RANGES

3 Miles	MiniLink Data 2400 – dipole to dipole
7 Miles	MiniLink Data 900 – dipole to dipole
10 Miles	MiniLink Data 2400 – dipole to 12" patch
20 Miles	MiniLink Data 900 – dipole to 41.5" yagi

Specifications subject to change without notice

TROUBLESHOOTING

PROBLEM	SUGGESTION
Camera does not respond when PTZ control functions are moved	No wireless control should be the only problem that would be related to the MiniLink Data transceivers. For all other problems, refer to the operations manual for other equipment that is being used. Try the following suggestions to obtain wireless control: 1. Verify mode selection switches are in the UP position for RS-422/485 or in the DOWN position for RS-232. 2. Both transceivers must match parameters. 3. Transceivers' parameters must match the system they are communicating with. 4. If using RS-422/485 protocol, make sure it is wired into TX +/- at the control panel and RX +/- at the camera. 5. Run a Com Test in RS-232 (in the CTU Software) to verify that each radio is transmitting and receiving data. 6. One or both radios may need to be returned for testing and repair under its 2-year limited warranty. Call MicroTek for return for repair information.
Unit fails when Com Test is run	1. Make sure that pins 2 and 3 of the DB9 connector (on the unit not plugged into the PC) are grounded using a paper clip. 2. Verify that both transceivers match all parameters. 3. Verify both units' mode selection switch is in the RS-232 position. 4. Both transceivers should have their antenna connected to work properly. 5. Make sure both units are powered up and their LED is on. 6. Switch radios so that the one previously connected to the PC is now the transmitting unit with the grounded pins. 7. One or both radios may need to be returned for testing and repair under its 2-year limited warranty. Call MicroTek for return for repair information.
There is a slight "blip" or other type of interference on the screen only when the PTZ control functions are accessed.	The MiniLink Data Transceivers should not interfere with any of the MiniLink Video Transmit/Receive systems since the frequencies are too far apart. The exception to that general rule is if you are using the MiniLink Data 2400 Series alongside the MiniLink 2.4 GHz Series for video. Otherwise, the problem may be a power issue. Make sure that each data transceiver and each video transmitter (or receiver) is powered by its own 12 VDC power supply.

WARRANTY INFORMATION

Microtek Limited Warranty

MicroTek Electronics extends the following LIMITED WARRANTY to the original owner/purchaser of this product:

1) If, within two years after date of initial sale, this product, or any part or portion thereof, shall prove upon examination by MICROTEK, to be defective in material or workmanship, MICROTEK will repair or replace such part or portion at MICROTEK's option. The warranty period on the repaired or replaced part or portion of this product shall be limited to the unexpired term of the original warranty. The buyer shall be responsible for all shipping and transportation of the product to MICROTEK for any performance under this warranty.

2) Conditions and Exceptions:

   a) Any accident to this product, any misuse or abuse, alternation, use in modified form, or any attempt to repair this product shall void this warranty. These conditions to the warranty include, but are not limited to, incorrect power connections, physical damage due to mechanical shock, exposure to moisture, and circuit modification.

   b) SHOULD THIS PRODUCT PROVE DEFECTIVE FOLLOWING PURCHASE, THE BUYER, NOT THE MANUFACTURER, DISTRIBUTOR, OR RETAILER, ASSUMES THE ENTIRE COST OF ALL SERVICING OR REPAIR, EXCEPT AS OTHERWISE PROVIDED BY THE TERMS OF THIS WARRANTY.

   c) FOR BREACH OF ANY WRITTEN OR IMPLIED WARRANTY ON THIS PRODUCT, THE BUYER IS LIMITED TO THE FOLLOWING DAMAGES. (1) THE COST OF LABOR TO REPAIR OR REPLACE DEFECTIVE PARTS OR PORTIONS OF THIS PRODUCT, AND (2) THE COST OF THE REPAIRED OR REPLACE PARTS OR PORTIONS OF THIS PRODUCT.

   d) NO OTHER EXPRESSED OR IMPLIED WARRANTIES HAVE BEEN MADE OR WILL BE MADE ON BEHALF OF MICROTEK WITH RESPECT TO THE SALE, REPAIR, INSTALLATION, OPERATION, OR REPLACEMENT OF THIS PRODUCT. MICROTEK DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OF THIS PRODUCT OR ITS FITNESS FOR ANY PURPOSE, AND THE BUYER AGREES THAT THIS PRODUCT IS SOLD "AS IS" AND THAT THE ENTIRE RISK OF QUALITY AND PERFORMANCE OF THIS PRODUCT IS WITH THE BUYER, EXCEPT AS OTHERWISE PROVIDED BY THE TERMS OF THIS WARRANTY.

   e) Some states/jurisdictions do not allow exclusions or limitations of incidental or consequential damages, or limitations on how long an implied warranty lasts, so the above exclusions or limitations may not apply to you.

3) Contact your dealer regarding return authorization for out of warranty repairs and any further product information.